

Manufacturing Advantage Service: Manufacturing Enabling

Intel Processor Manufacturing & Shipping: Thermoformed Tray Use



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Revision History

Date	Revision	Updates
January, 2003	1	Initial release
July, 2003	1.1	<ul style="list-style-type: none">• Additional information on materials handling• Added a back up section

Agenda

- Introduction
- Shipping Media Overview
- Key Considerations for Receiving Processors
- In-site Handling – Materials Handling Considerations
- Backup
 - Strapping considerations

Introduction

- Intel is introducing a new shipping tray for the following processors
 - Intel® Pentium® 4 and Intel® Celeron® processors in the FCPGA2 packages with 478 pin
 - Mobile Intel® Pentium® 4 Processor - M, Mobile Intel® Pentium® III Processor - M and Celeron® processors in the micro-FCPGA package with 478 pin
- This material is intended to familiarize production engineers and technicians on the logistical considerations associated with the new shipping media.
- Methodologies provided in this document are for reference only
- Other methodologies and solutions may be required due to specific OEM requirements and constraints

Thermoformed Shipping Media Overview



(P) CUST PROD:		(IB) BOX: K601LT23
(V) SUPPLIER: 04195		(M): (C):
(IP) IPN: YK80542KX50032M		LEVEL HOURS
(S) SPEC: Q HL3 (38P) NNN: 822827		BAG SEAL DATE
(IT) LOT: 4913WTL3	(Q) QTY: 84	(9D) DATE: 01
(IT) LOT: L913WTLP	(Q) QTY:	(9D) DATE:

Example of a shipping label, actual label may be different

- Approximate box dimensions
 - 12 5/8" x 14 1/8" x 4 1/8"
 - 32.1 cm x 35.9 cm x 10.48 cm
 - < 35 lb in weight
- Not palletized
 - Over-box used
- 3x8 array
- 12 populated trays per box in two stacks for processor with IHS (integrated heat spreader)
- 14 populated trays per box in two stacks for processor without IHS
- Empty thermoformed tray on top
- Chipboard shim on the bottom
- 4 straps per stack (3 crosswise and 1 lengthwise)
- Recommended maximum storage condition:
 - 50 °C with 70% R/H



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Processor Receiving

Key Considerations

- Place box on a flat ESD-safe surface
- Box should not have any damage
- Use industrial safe auto-retractable knife to open the box as illustration
- Operator must be grounded



Processor Receiving

Key Considerations

- After opening the box, remove tray stack at an ESD-safe workstation
- Operator must be grounded
- Place the tray stack on a flat, ESD-safe surface
- Perform a quick glance on the tray orientation and strap tension



Processor Receiving

Key Considerations – Tray Orientation

- Ensure the chamfer corner of all trays in the stack are line up or tray part numbers are on the same side



Processor Receiving

Key Considerations – Strap tension

- Strap tension should be consistent around the tray stack
- The tension should be just tight enough to limit any movement of the tray
 - There should be no loose spacing between strap and tray, and no tray deformation
 - Refer to back up materials for illustration of incorrect strap tension
- The spacing between trays should be uniform
 - Non-uniform spacing may be an indication of some processors not seated properly in the tray pocket



Illustration of correct strap tension

Processor Receiving

Key Considerations – Strap tension

- Slight bending on the thermoformed tray may be observed as illustrated for the top tray
- This is normal and it does not affect the protection to the processors

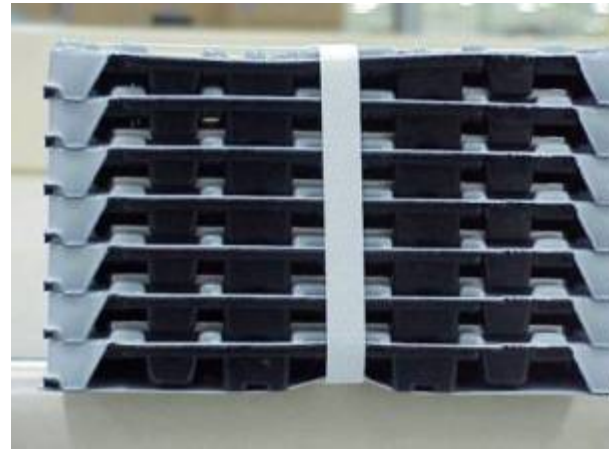
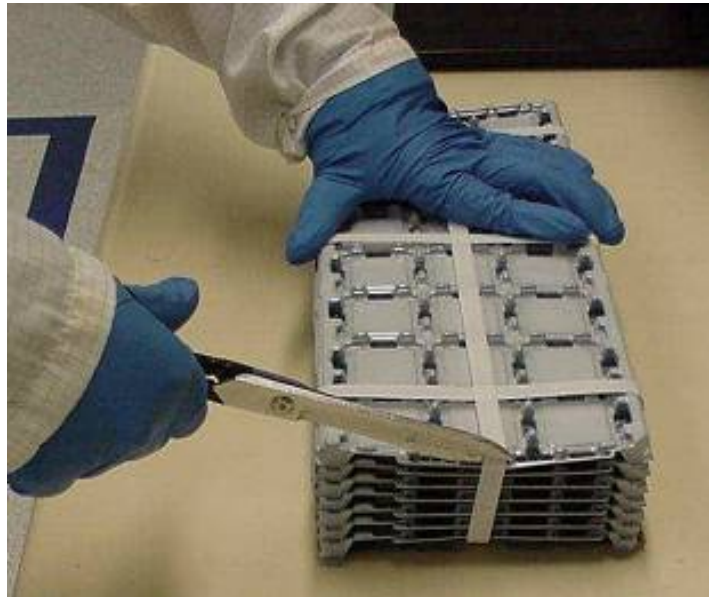


Illustration of correct strap tension

Processor Receiving



Key Considerations (Cont.)

- Strap Removal Procedure
 - Place the tray stack with the top side (without cardboard shim) facing up on an ESD-safe surface
 - Put one hand to secure the tray stack
 - Place an industrial safe scissors across the pocket seating plane guide and cut the straps lengthwise as illustrated
 - Gently remove the strap from the tray stack while leaving one hand to secure the tray stack

Processor Receiving



Key Considerations (Cont.)

- Strap Removal Procedure
 - Put one hand to secure the tray stack
 - Place an industrial safe scissors above the pocket seating plane guide and cut the straps crosswise as illustrated
 - Gently remove the straps from the tray stack while leaving one hand to secure the tray stack

Materials Handling Considerations

- Thermoformed Tray is made with softer materials to better absorb shock and vibration and designed to ease materials handling in customer manufacturing line
- There is also unique set of materials handling procedure associated with the thermoformed tray

Materials Handling Considerations

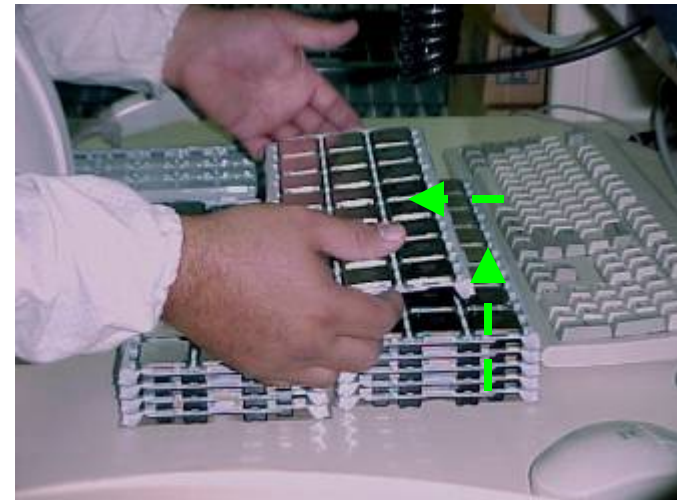
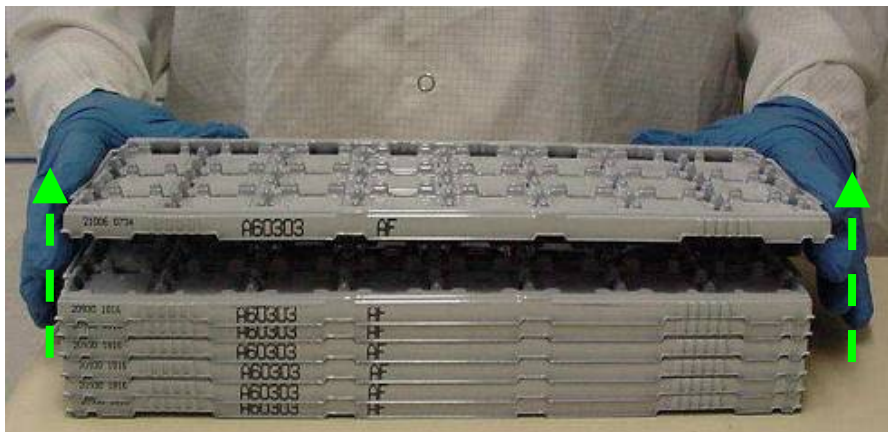
- Tray Handling Procedure
 - Tray stack should be securely fastened during transport and storage
 - Only for in-house handling, ESD tray strap may be used to secure the tray stack
 - An additional tray should be put on top of the tray stack for storage and transportation to prevent processor from re-positioning in the tray pocket
 - Always use both hands holding the tray stacks from the ends when moving tray stack from one place to another



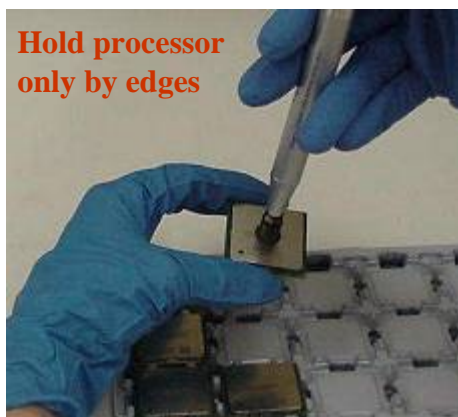
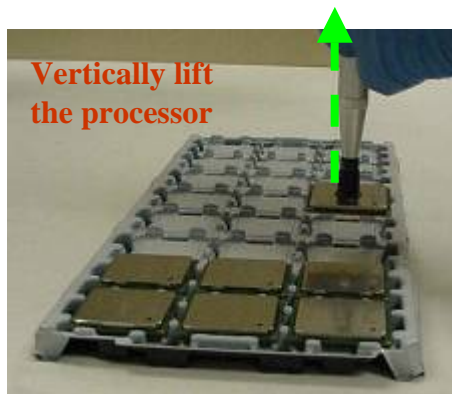
Hold the tray stack with both hands

Materials Handling Considerations

- Tray Handling Procedure cont...
 - A straight tray lift procedure is recommended when removing from stack to prevent damage to processors in tray underneath
 - Tray should be maintained at an even level during movement



Materials Handling Considerations



Note: Photos shown here are in reference to desktop processor

- Store trays at a height level for ease of sighted access
- Pick up a processor package vertically from tray using an ESD-safe Vacuum Wand
- Have the other hand hold the processor package by sides to prevent damaging pins or contaminating the heat spreader
- Release the processor packages by pressing the vacuum release button. Allow for cushioned and ESD-safe, pin side down, unloading and transportation in the manufacturing line
- Visually inspect the processor for bent pins
- Replace processor or repair damaged pins on processor

Materials Handling Considerations: Tooling

ESD-Safe Vacuum Wand

- Vacuum Wand Information
 - Manufacturer : Slimline Mfg Corp., PO Box 3295 Scottsdale AZ 85271. Phone : (480) 967 5053
 - Model : SLIVWC9
 - Always refer to Vacuum Wand manufacturer for installation guideline.

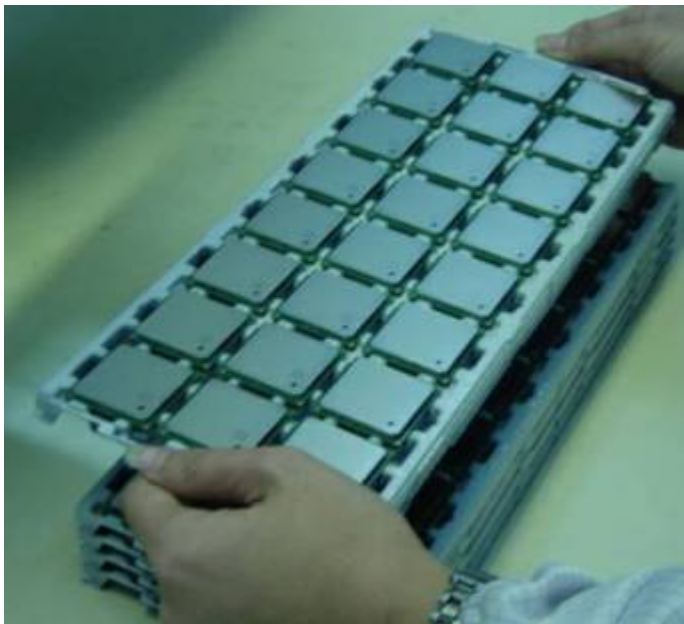
Industrial Safe scissors

- Scissor information
 - Manufacturer : William Whiteley
 - Supplier : Farnell (www.farnell.com)
 - Order code : 709-9307
 - Description : Safety “Safe-T-Guard” *

* other brands and names are property of their respective owners.

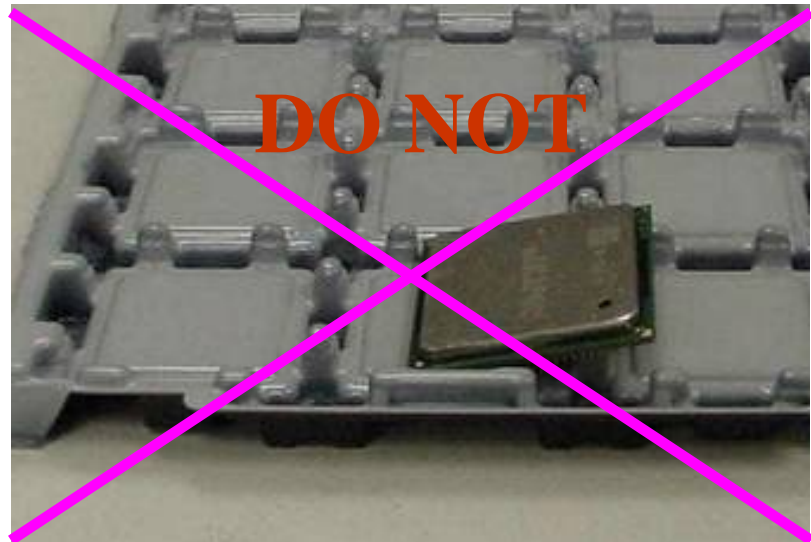
Materials Handling Considerations

- Always use both hands to handle the tray and keep it leveled to ensure processors are properly seated in the tray pocket. Failure to do so may cause processor damage
- Do not “twist” the tray as processor may reposition itself outside the tray pocket



Materials Handling Considerations

- Failure to do the following may cause processor damage
 - Ensure processors are always properly seated in the tray pocket.
 - Do not leave processor sitting on the edge of the tray pocket.



Back Up

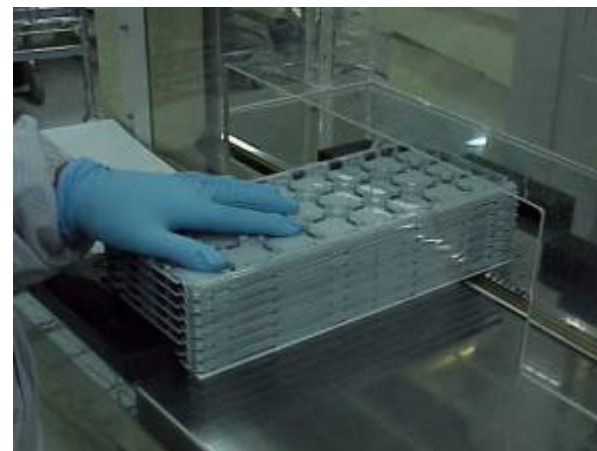


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Strapping Process Considerations

Materials Handling Considerations: Strapping

- Ensure all the trays are aligned by the tray corner chamfer
- When loading the tray stack into the strapping machine, use one hand to hold one side of the tray stack to make sure all the trays do not move
 - Uniform spacing across between trays
 - Non-uniform spacing or existence of any gap may be an indication of some processors not seated properly in the tray pocket



Uniform spacing across the tray

Materials Handling Considerations: Strapping

- Strapping process should not proceed if non-uniform spacing between trays is observed.
- The tray stack should be removed and conduct a visual inspection to ensure no processor was damaged



Non-uniform spacing

Materials Handling Considerations: Strapping

- The strapping requirement of the thermoformed tray for Intel® Pentium® processor with 478 pin includes 4 straps to provide necessary structural support during transportation as illustrated



Materials Handling Considerations: Strapping

Key Considerations – Incorrect strap tension

Strap tension too high causing excessive tray deformation

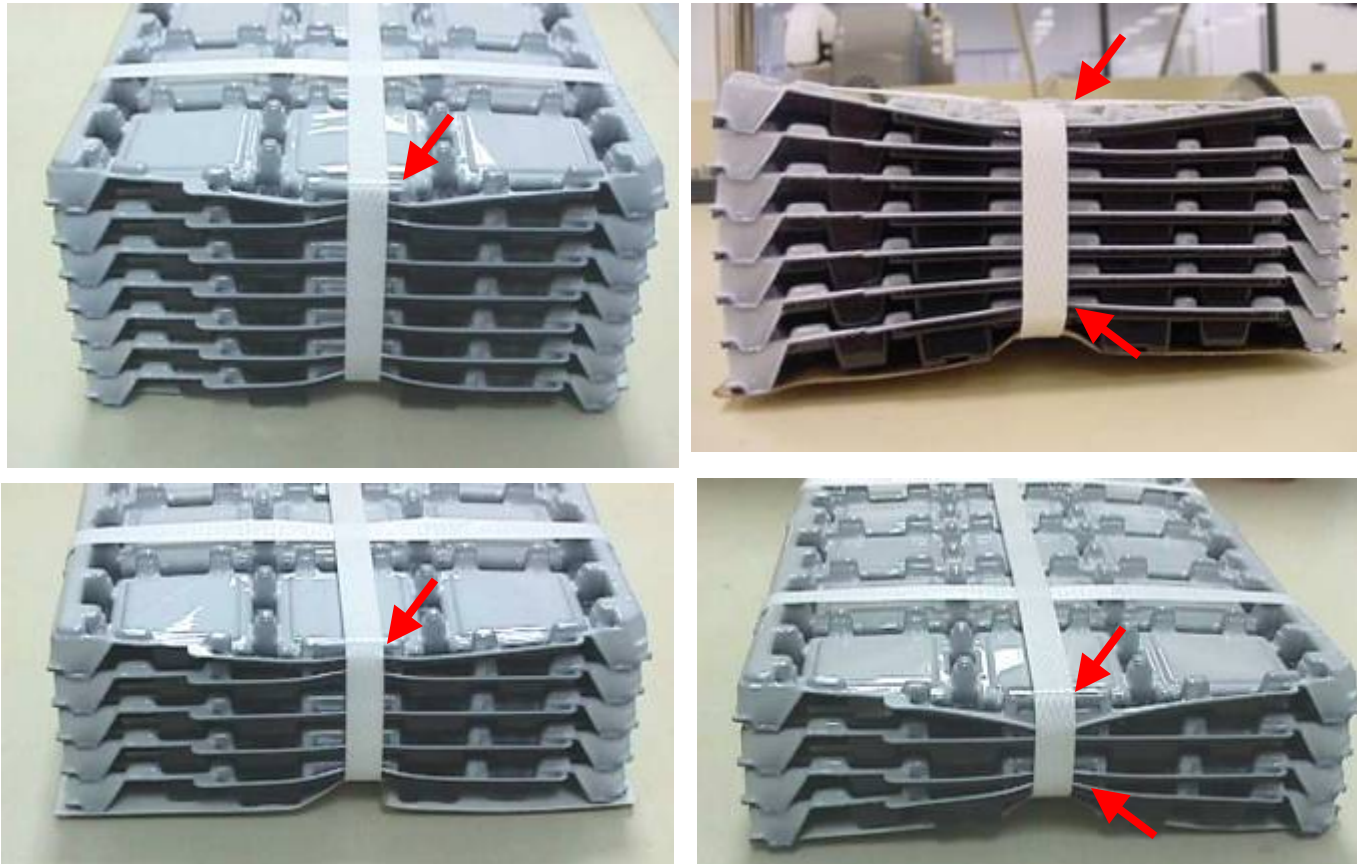


Illustration of incorrect strap tension

Materials Handling Considerations: Strapping

Key Considerations – Incorrect strap tension

- Insufficient strap tension causing excessive “gap” / “slack” spacing

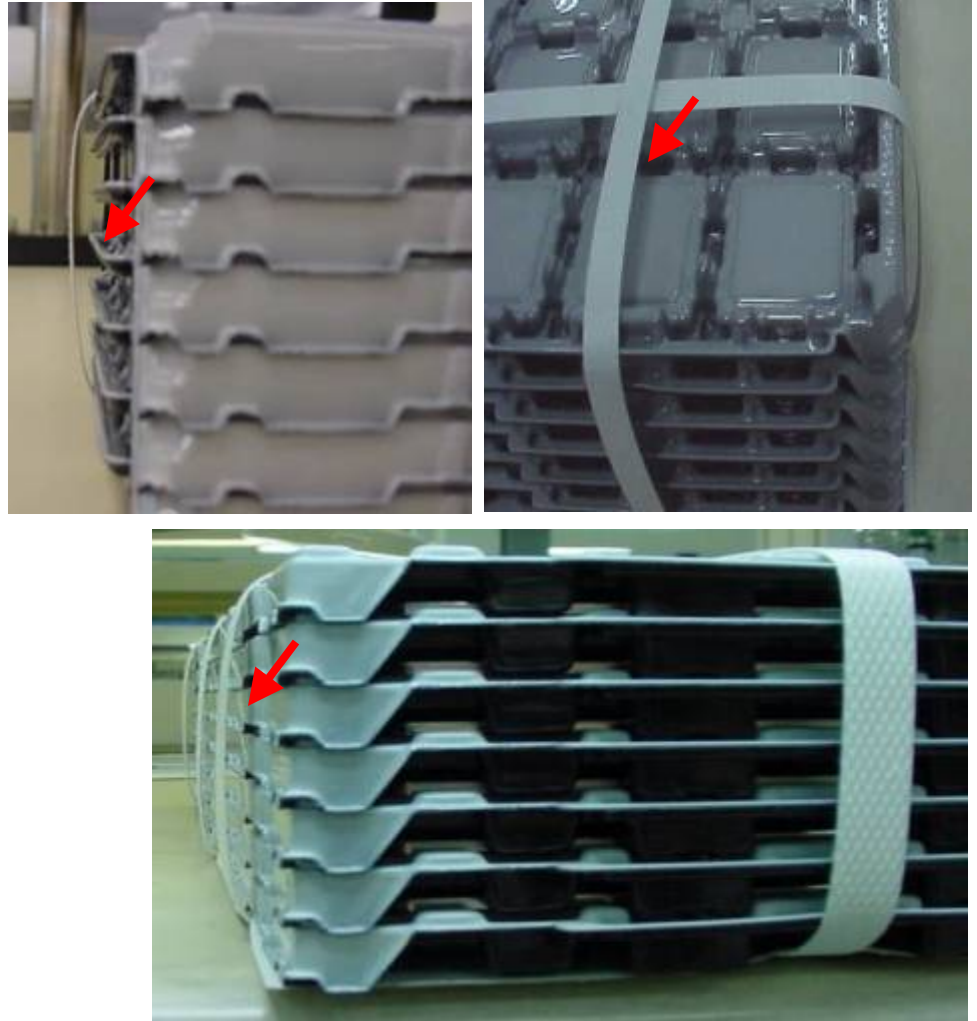


Illustration of incorrect strap tension